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GEOGRAPHICAL NOTES.—The French Scientific Expedition on board the *Travailleur*, and of which M. Milne-Edwards was the head, has been recently exploring the western portion of the Mediterranean. The seas off the coasts of Provence and Corsica were carefully explored to a depth of over 8700 feet, and after dredging between Spain and the Balearic Islands, the *Travailleur* put into Tangier, which was the point of departure for the second part of the voyage in the Atlantic Ocean. The numerous soundings and dredgings off the coast of Portugal produced some remarkable results, as they revealed the presence, at a depth of from 4900 to 5900 feet, of large fishes of the shark family which exist there in large numbers without ever coming to the surface. In returning to Rochefort, the greatest depth which has ever been found in the seas of Europe, was obtained by the dredge in $44^{\circ} 48' 30''$ N. lat., $4^{\circ} 40' 15''$ W., viz., 16,733 feet. A great number of foraminifera and radiolaria, several crustacea and an annelid were found in the mud here brought up by the dredge. As regards the Mediterranean, the *Travailleur* expedition has proved that this sea has no fauna of its own, this want being supplied by immigration from the Atlantic Ocean.

The Russian scientific expedition to the mouth of the Obi, has determined a number of positions astronomically. The eastern coast line of the gulf has been found to be placed from twenty to twenty-five kilometers too far to the east on the maps. If a similar correction is to be applied to the west coast, it will make the Yamal peninsula very narrow.

It is estimated that a third of Asia and a thirtieth part of Europe still remains to be explored.

Colonel Prejevalsky is actively engaged on his great work on Tibet and China, the first volume of which will be published in May with a map.

Nature notices the Journal of the Geographical Society of Tokio. It is printed wholly in the Japanese characters. It contains a paper on Saghalin and the Kurile Islands, and one on the historical geography of Japan.

MICROSCOPY.¹

THE NEW TRICHINOSCOPE.—So long as the detection of trichinæ in the flesh of animals used for food was solely a scientific curiosity and sanitary precaution, it naturally devolved upon scientific students to whose instruments and skill it presented no difficulties whatever; but when by depreciating, to a great extent falsely, the market value of a staple article of food, and inter-

¹ This department is edited by Dr. R. H. WARD, Troy, N. Y.

fering with the distribution of one of the great articles of export from this country, it became a question of national and commercial importance, there arose a need for some means by which unscientific persons, acting merely in the interest of trade, could determine with facility the presence or absence of these parasites. A thorough examination of the pork offered for sale must not only prevent the use of that which is dangerous, but also show the gross exaggeration of the prejudice recently excited against

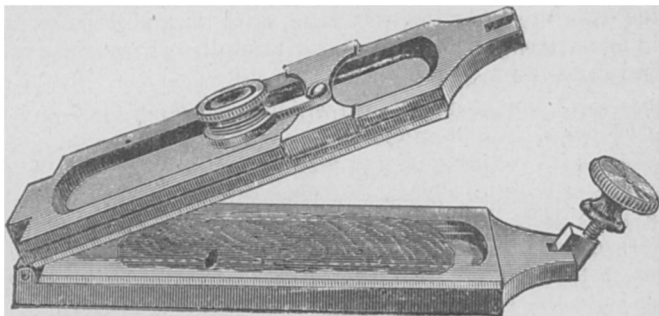


FIG. 1.

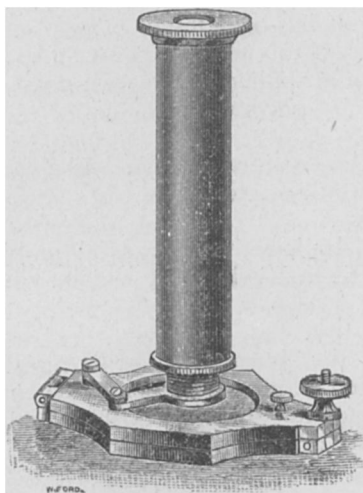


FIG. 2.—THE NEW TRICHINOSCOPE.

this article of food. Perhaps no means is so available for this purpose as the trichinoscope produced by the Bausch & Lomb Optical Co., of Rochester. This instrument consists of a compressorium with a magnifying arrangement so mounted that it can be easily slid over the whole surface of the fragment of flesh which has been flattened between the glasses. In the form shown in

Fig. 1, the compressorium is long and narrow and fitted with a pair of 3 x 1 glass slips, such as are commonly used by microscopists, and it is supplied with a magnifying doublet of sufficient power for the easy recognition of trichinæ. Instead of the doublet, or compound microscope tube may be used, in which case it is best combined with a short compressorium having round disks of thin glass as shown in Fig. 2. On the whole, the simplest form, as drawn in Fig. 1, is considered preferable, and it is furnished at the remarkably low price of \$3. Aside from its intended use, this instrument is an excellent pocket microscope for field use when making collections of algæ and infusoria among the ponds and ditches.

STRUCTURE OF THE COTTON FIBER.—Foremost among the instances of the present day, of the application of scientific methods and instruments to the development of economical interests, is the microscopical study of fibers and fabrics. The three lectures on the structure of the cotton fiber, delivered by Dr. F. H. Bowman before the Bradford Technical School in 1880, have been published in Manchester, and they constitute a volume of remarkable interest and value.¹

Dr. Bowman combines, in a rare degree, the love of truth and the analytical methods of a scientist with the practical sense of a business man, and his book, though intended primarily for the instruction of cotton spinners and others concerned in that industry, is a still greater acquisition to the library of the botanist and the microscopist. The development, size, structure, and varieties of the different kinds of cotton fibers known to trade, their varieties of place and season, their qualities and faults, and their behavior under the processes of preparation, dyeing and spinning, are discussed with great thoroughness, and are illustrated with good drawings. A companion book on the structure of wool is promised by the same author. Thus is opened by science a field, whose importance has scarcely been realized before, for the practical improvement of those engaged in the manufacture of fabrics. The author's incidental directions for the microscopical examinations upon which the whole work is founded, are in the main judicious and excellent, and we fully concur in his assumption that the best attainable objectives are desirable for the work; though the experience of the present day is rather in favor of the employment, for such work, of smaller and simpler stands instead of those as large and elaborate as the one figured by him. The author does not specify the powers most available; but we have found a 1 inch or 1½ convenient for preliminary survey of the material, or $\frac{1}{16}$ for the study of its general character, and a $\frac{1}{16}$ or $\frac{1}{8}$ immersion for study of sections, local details, effects of dye

¹ The Structure of the cotton fiber in its relation to Technical Applications. By F. H. Bowman, D. Sc. 8vo, pp. 211, plates 11. John Wiley & Sons, 15 Astor Place, New York. \$4.

stuffs, etc. These lenses should all be of very high angle, unless the expense be a positive objection. An instrument costing \$50 to \$75, would be sufficient for every-day use in a mill for examining the stock as received and worked up; but one worth \$300 is none too good for a person designing to give advice and decisions as an expert in obscure cases.

The editor of the *Boston Journal of Commerce* has introduced the microscope into this field in this country, and has already in important cases detected the cause of the imperfect working of cotton apparently of good quality. He strongly endorses the practical value of the use of the microscope by the cotton mill agent or superintendent, specifying, among other things, that "it tells him the effect of different mordants at a glance, the effect of various chemicals which are used, also the real value of different dye stuffs or drugs, and wherever the mixing of fibers is followed or the actual fabric of goods is to be investigated, there is no other possible way to do it than by the microscope."

The prominence which the microscope is assuming in this country in this technical application, may be judged from the fact that in the catalogue of instruments, apparatus, etc., for designers and others engaged in the manufacture of textile fabrics, by A. & A. F. Spitzli of West Troy, N. Y., of the 118 pages of the catalogue, the first 48 are devoted to microscopical apparatus. Messrs. Spitzli also publish a "Manual for managers, designers and weavers," an octavo book of 250 pages, which is of interest to all, whether of scientific or of practical intent, who are desirous of studying thoroughly the structure of fabrics.

PRACTICAL MICROSCOPY.—Under this title Mr. George E. Davis, editor of the *Northern Microscopist*, has issued a general text-book of the microscope and its manipulation. It is a work of over 300 octavo pages, illustrated with wood cuts, and published by David Bogue of London. The author announces his intention, with a cheaper and more modern book, to occupy much the same field as did Queckett's now obsolete treatise on the "Use of the Microscope." He practically makes good the claim to be a successor of Queckett by ignoring American and continental apparatus almost entirely, and confining himself to descriptions of English work. Moderate credit is given, in the preface and elsewhere, for American precedence in the introduction of high angled objectives; but these objectives (or any of American make for that matter) are omitted from the practical part of the work. Only one American stand is described, and the accessories mentioned are almost exclusively English. While this peculiarity may make the book more convenient for practical use among its largest constituency, nearer home, it will render it somewhat less attractive and satisfactory to American students.

A similar deficiency occurs in the bibliography of algæ, infusoria, etc., of minerals, and mosses, where no mention is made of

even such elegant works as Wood's Fresh-Water Algæ, Leidy's Fresh-Water Rhizopods, Zirkel's Microscopical Petrography, and Sullivan's Icones Muscorum. On the other hand, the American style of naming oculars by their degree of amplification, as 2-inch, 1-inch, etc., is noted with approval; as is also the adoption of the metric system in micrometry, and especially the selection of the one-thousandth of a millimeter, under the name of micro-millimeter or micra, as the unit to be employed. The question of angular aperture, and of testing objectives, is discussed with candor and freshness. The later chapters of the book treat of collecting objects, dissections, section-cutting, drawing and measurements, polariscope, micro-spectroscope, staining and injecting, and preparing and mounting objects. While giving recipes for various reagents and mounting media and cements, the author offers the very sensible advice that parties who require only small quantities should purchase them from a dealer instead of attempting their manufacture. He also advises against the use of "secret nostrums." Natural history subjects, which form so large a part of some of the manuals, are only touched upon incidentally. The work is freely illustrated, though only one of the plates is accompanied by a scale showing the magnifying power employed.

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SCIENTIFIC NEWS.

— In the *Kansas City Review*, Mr. L. F. Ward gives the following sensible views as to the reasons why the Western plains are destitute of forests. He considers that the prairies are without forests, because of fire set by Indians: Since the elevation of the Rocky Mountain range at the close of the Tertiary age, the atmosphere, in the general easterly movement which it possesses at all latitudes within the United States, has at all times lost the greater part of its moisture by condensation upon the cold summits of these and the more western ranges, so that by the time it reaches the great plains it is too dry for precipitation except under unusual conditions. As it moves still further eastward across a level country, having river valleys and lake basins, it comes in contact with currents from the north, the south and the east, brought there by the constant disturbances of barometric pressure with which all are acquainted, and in this manner it gradually becomes at length again sufficiently laden with moisture to yield portions of it to the soil when condensed by currents of unlike temperature. This characteristic becomes more and more marked with the eastern movement until the Mississippi valley is reached, in which and at all points eastward the rain-fall, varying from thirty-two to sixty inches is sufficient to be depended upon for agricultural purposes.

Where the annual precipitation is below twenty, or perhaps